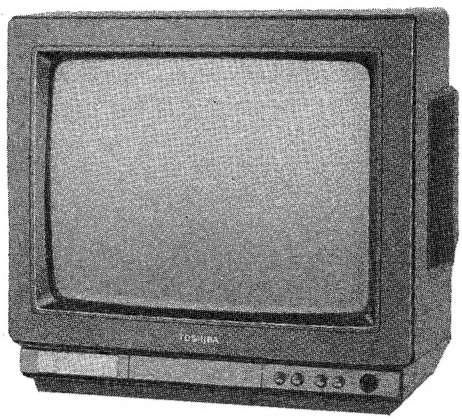
SERVICE DATA
FILE NO. 050-024
PAL-B/G SYSTEM

TOSHIBA
COLOUR TELEVISION
145E7DZ



SPECIFICATIONS

Power Input Rating:	46 watts, AC 220 volts, 50 Hz	
Aerial Input Impedance:	75 ohm unbalanced type for UHF	
Receiving Channels:	VHF channels	channels E2 to E4, E5 to E12 and S1, S2 to S20
	UHF channels	channels 21 to 69
Intermediate Frequencies:	Picture I-F carrier frequency	38.9 MHz
	Sound I-F carrier frequency	33.4 MHz
	Colour sub-carrier frequency	34.47 MHz
Chassis Construction:	IC Solid State, Horizontal Chassis	
Picture Tube:	14 in. A38EAC00X01, 335 mm (measured on diagonal of viewable picture area), 90° Deflection	
Sound Output:	1.0 watt (at 10% harmonic distortion), Max. 1.4 watts	
Speaker:	77 mm round	
Cabinet:	Table type	
Dimension:	Hight	339 cm
	Width	384 cm
	Depth	370 cm
Weight (Net):	9.5 kg	

Specifications are subject to change without notice.

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SAFETY INSTRUCTIONS

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND THE "PRODUCT SAFETY NOTICE" INSTRUCTIONS BELOW.

X-RAY RADIATION PRECAUTION

1. The E.H.T. must be checked every time the receiver is serviced to ensure that the C.R.T. does not emit X-ray radiation as result of excessive E.H.T. voltage. The nominal E.H.T. for this receiver is 19.0 kV at zero beam current (minimum brightness) operating at 220V a.c. The maximum E.H.T. voltage permissible in any operating circumstances must not exceed 20.9 kV. When checking the E.H.T., use the 'High Voltage Check' procedure on page 5 in this manual using an accurate E.H.T. voltmeter.
2. The only source of X-RAY radiation in this receiver is the C.R.T. To prevent X-ray radiation, the replacement C.R.T. must be identical to the original fitted as specified in the Parts List.
3. Some components used in this receiver have safety related characteristics preventing the C.R.T. from emitting X-ray radiation.
   For continued safety, replacement component should only be made after referring the Product Safety Notice below.

SAFETY PRECAUTION

1. This receiver has a nominal working E.H.T. voltage of 23 kV. Extreme caution should be exercised when working on the receiver with the back removed.
   Do not attempt to service this receiver if you are not conversant with the precautions and procedures for working on high voltage equipment.
   When handling or working on the C.R.T., always discharge the anode to the receiver chassis before removing the anode cap.
   The C.R.T., if broken, will violently expel glass fragments and handling faulty or new C.R.T.'s should be carried out with extreme care.
   Do not hold the C.R.T. by the neck as this is a very dangerous practice.
2. It is essential that to maintain the safety of the customer all cable forms be replaced exactly as supplied from factory.
3. A large part of the chassis used in this receiver is, when operating, at approximately half mains potential at all times. It is therefore essential in the interest of safety that when serving or connecting any test equipment the receiver should be supplied via a suitable isolating transformer of adequate rating.
4. Replace blown fuses within the receiver with the fuse specified in the parts list.
5. When replacing wires or components to terminals or tags, wind the leads around the terminal before soldering. When replacing safety components identified by the international hazard symbols on the circuit diagram and parts list, it must be a Toshiba approved type and must be mounted as the original.
6. Keep wires away from high voltage or high temperature components.

PRODUCT SAFETY NOTICE

Many electrical and mechanical components in this chassis have special safety-related characteristics. These characteristics are often passed unnoticed by a visual inspection and the X-ray radiation protection afforded by them cannot necessarily be obtained by using replacements rated at higher voltages or wattage, etc. Components which have these special safety characteristics in this manual and its supplements are identified by the international hazard symbols on the schematic diagram and parts list. Before replacing any of these components read the parts list in this manual carefully. Substitute replacement components which do not have the same safety characteristics as specified in the parts list may create X-ray radiation.

FRONT CONTROLS VIEW

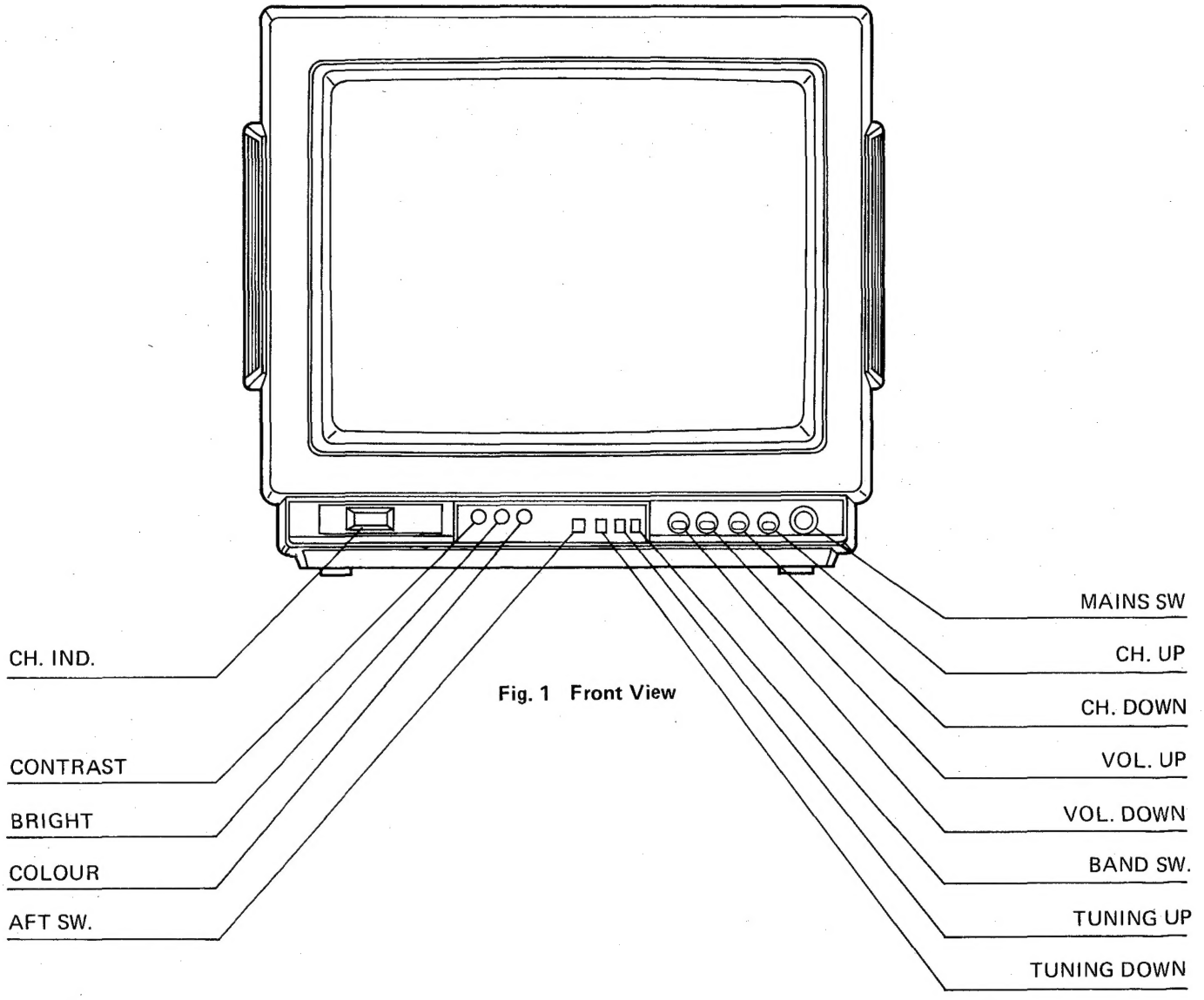


Fig. 1 Front View

REAR VIEW

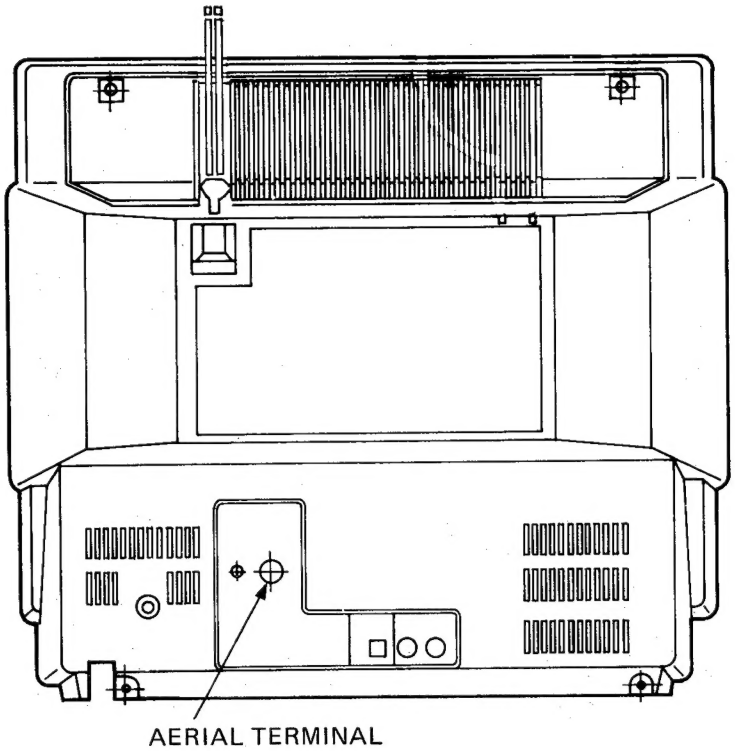


Fig. 2 Rear View

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION," "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

INSTALLATION AND SERVICE ADJUSTMENTS

GENERAL INFORMATIONS

All adjustments are thoroughly checked and corrected when the receiver leaves the factory. Therefore the receiver should operate normally and produce proper colour and B/W pictures upon installation. However, several minor adjustments may be required depending on the particular location in which the receiver is operated.

This receiver is shipped completely in cardboard carton. Carefully draw out the receiver from the carton and remove all packing materials.

Plug the power cord into a convenient 220 volts 50Hz AC two pin power outlet.

Turn the receiver ON.

Check and adjust all the customer controls such as BRIGHTNESS, CONTRAST and COLOUR Controls to obtain natural colour or B/W picture.

AUTOMATIC DEGAUSSING

A degaussing coil is mounted around the picture tube so that external degaussing after moving the receiver is normally unnecessary, providing the receiver is properly degaussed upon installation. The degaussing coil operates for about 1 second after Mains switch is switched ON. If the set is moved or faced in a different direction, the Mains switch must be switched off at least 10 minutes in order that the automatic degaussing circuit operates properly.

Should the chassis or parts of the cabinet become magnetized to cause poor colour purity, use an external degaussing coil. Slowly move the degaussing coil around the faceplate of the picture tube, the sides and front of the receiver and slowly withdraw the coil to a distance of about 2 m before disconnecting it from AC source. If colour shading still persists, perform the COLOUR PURITY ADJUSTMENT and CONVERGENCE ADJUSTMENTS procedures, as mentioned later.

HIGH VOLTAGE CHECK

CAUTION: There is no HIGH VOLTAGE ADJUSTMENT on this chassis.

1. Connect an accurate high voltage meter to the second anode of the picture tube.
2. Turn on the receiver. Set the BRIGHTNESS and CONTRAST Controls to minimum (zero beam current).
3. High voltage will be measured below 20.9 kV.
4. Rotate the BRIGHTNESS Control to both extremes to be sure the high voltage does not exceed the limit of 20.9 kV under any conditions.

HORIZONTAL OSCILLATOR ADJUSTMENT

If there is an indication of unstable horizontal sync., adjust the HORIZONTAL HOLD Control (R451) to remove the condition. Adjust the HORIZONTAL HOLD to the centre of the pull-in range.

HEIGHT ADJUSTMENT

HEIGHT Control (R352) on MAIN Board changes the size of the picture or pattern, having an equal effect on the top and bottom. Make final adjustment to overscan the mask 2cm at top and bottom.

FOCUS ADJUSTMENT

Adjust FOCUS Control on FLYBACK TRANS. (T461) for well defined scanning lines in the centre area on the screen.

PAL MATRIX ADJUSTMENT

1. Tune in the coulor signal of Philips pattern.
2. Set the COULOR control to obtain a proper coulor.
3. Connect oscilloscope to pin 12 of Q501.
4. Short R205 with a jumper wire to shut off video signal.
5. Adjust the 1H DL AMP control (R551) to coincide the ALT (B-Y) bar of Philips pattern.
6. Adjust the 1H DL PHASE control (L551) to coincide the 75% coulor bar of Philips pattern.
7. Repeat the procedures 4 and 5 above to obtain the control result.

R552 ADJUSTMENT

1. Tune in the coulor signal of Philips pattern.
2. Set the COULOR control to obtain a proper coulor.
3. Connect oscilloscope to pin 12 of Q501.
4. Short R205 with a jumper wire to shut off video signal.
5. Adjust R552 to reduce the demodulation level of R-Y fixed bar on the left side to zero.
6. Check the PAL MATRIX adjustment to readjust the PAL MATRIX, if necessary.

BELL COIL (LM51) ADJUSTMENT

1. Receive SECAM colour bar signal.
2. Connect the synchroscope to the terminal TPM-01.
3. Adjust LM51 for the flat level ofaamplitude in each colour bar waveform on the scope. (See figure 3.)

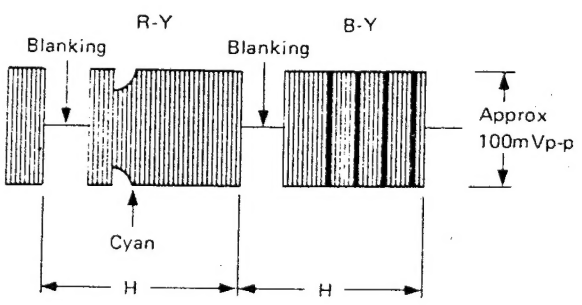


Figure 3.

DETECTOR (LM52, RM52) ADJUSTMENT

1. Receive SECAM colour bar signal.
2. Connect the synchroscope to the pin 20 of QM01.
3. Adjust RM52 to coincide the white level of R-Y signal and B-Y signal.
4. Adjust LM52 to coincide the white and black level of R-Y signal and B-Y signal.
5. Repeat the item 3 and 4 procedures.
6. Connect the synchroscope to the pin 9 of QM01, confirm the response for no carrier wave signal.

4.43 MHz OSC (CM50) ADJUSTMENT

1. Receiver SECAM colour bar signal.
2. After completing all adjustment of Q501, proceed with steps below.
3. Short R205 with a jumper wire to shut off video signal.
4. Connect the synchroscope to the pin 12 of Q501, adjust CM50 to coincide the cyan part.

1H-DL (RM51) ADJUSTMENT

1. Receive SECAM colour bar signal.
2. Connect the synchroscope to the pin 14 of QM01, adjust RM51 for flat level of amplitude in each colour bar wave form at front and back of 1H.
3. Check the 4.43 MHz OSC ADJUSTMENT to read-just the 4.43 MHz OSC, if necessary.

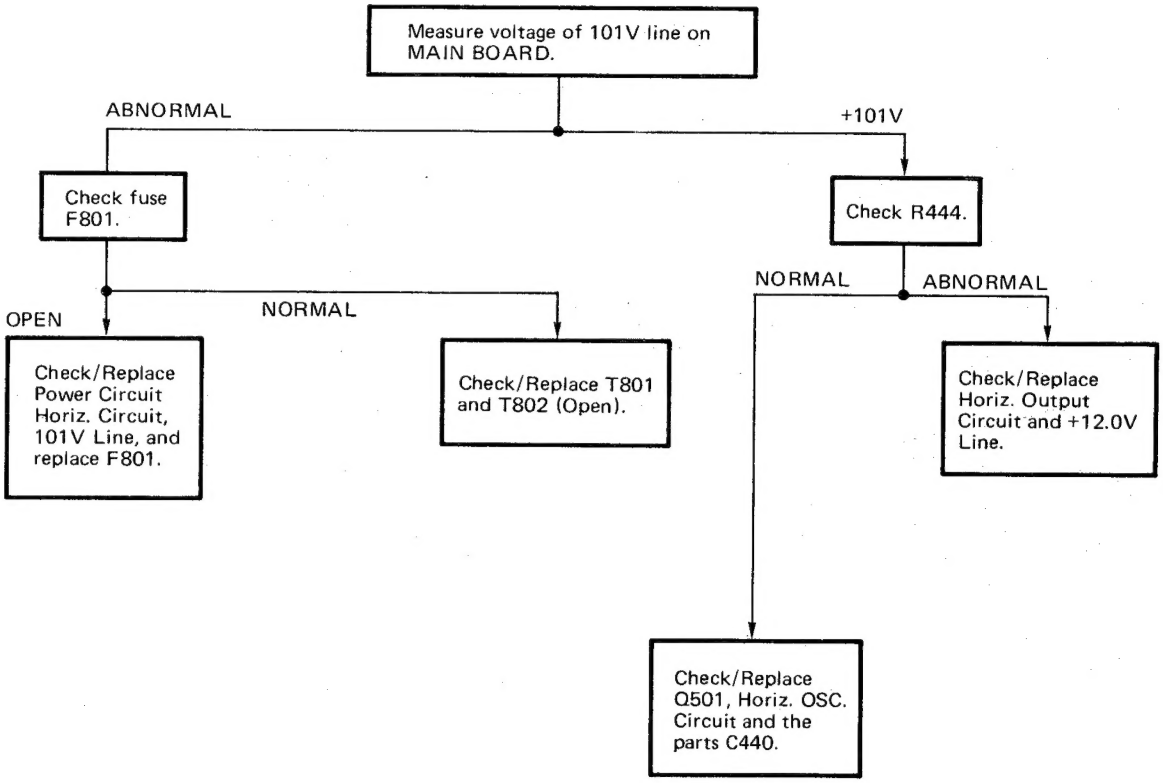
CRT GREY SCALE ADJUSTMENT

1. Tune in an active channel.
2. Set the CONTRAST, BRIGHTNESS, COLOUR Controls to minimum.
3. Set the service SW. (S201) in the "H. LINE" position.
4. Turn the SCREEN Control (on T461) fully counter-clockwise.
5. By rotating the RED, GREEN and BLUE CUT OFF Controls (R557, R558, R559) clockwise from the minimum, set them to the mid position.
6. Rotate the SCREEN Control gradually clockwise until the first horizontal line of a colour (RED, GREEN or BLUE) appears slightly on the screen.
   Set the SCREEN Control to this position.
   At the base of the colour, rotate the remaining two CUT OFF Controls gradually clockwise until the horizontal lines of each colour appear slightly on the screen.
   The line may look like white if the CUT OFF Controls are adjusted properly.
7. Set the service SW. (S201) in the "RECEIVE" position.
8. Rotate the BRIGHTNESS and CONTRAST Controls to obtain dark grey raster. Then check the white balance in low brightness. If the white balance is not proper, retouch the CUT OFF Controls to obtain a good white balance in both low and high light areas.

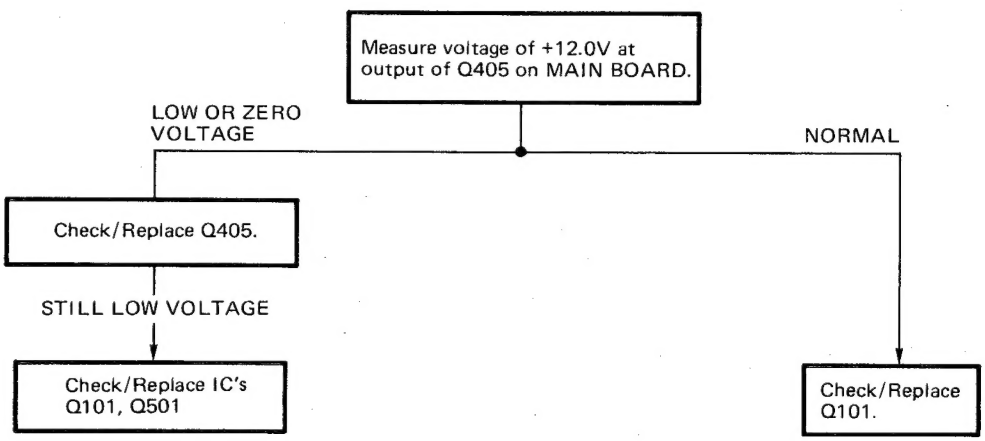
TROUBLESHOOTING CHARTS

The following charts are devoted to troubleshooting which, if followed carefully, will assist you in tracking down a fault to the correct stage.
In order to utilize the charts (fault trees), firstly establish the complaint, e.e.-No Raster, No Sound.
Locate the chart applicable and then progress through the various alternatives until a final block indicates the offending components or stage.

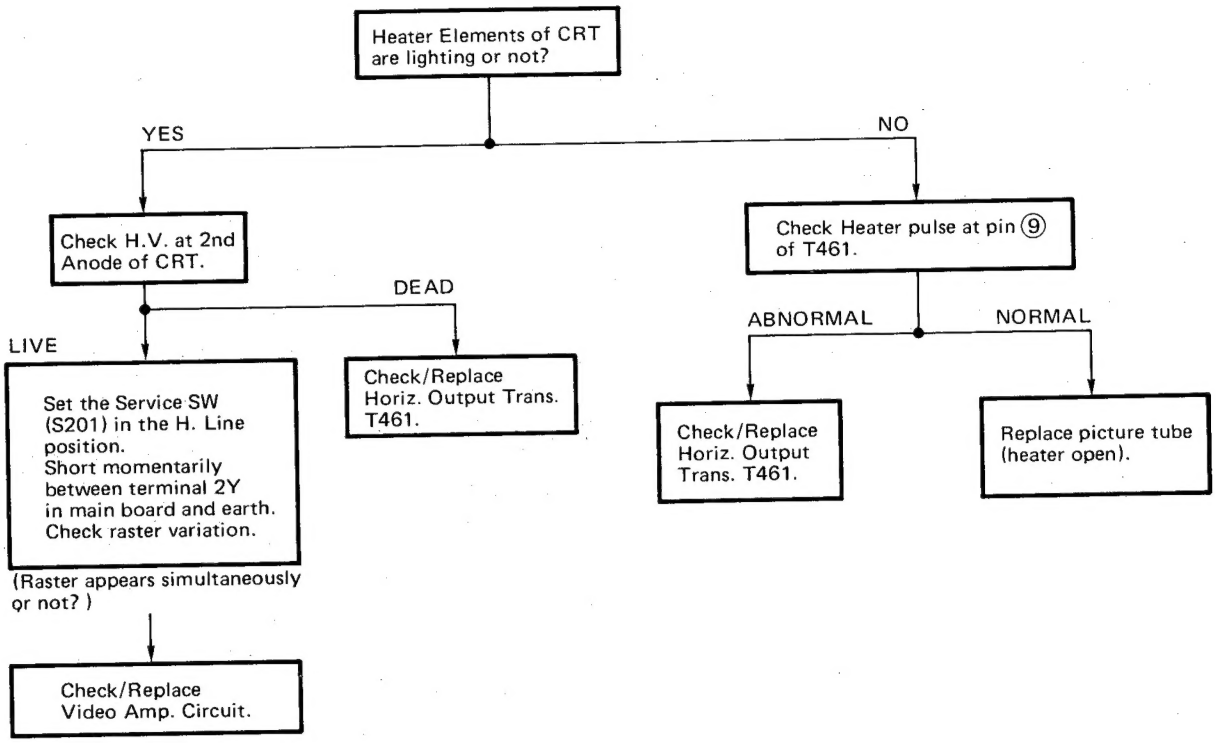
1. NO RASTER AND NO SOUND



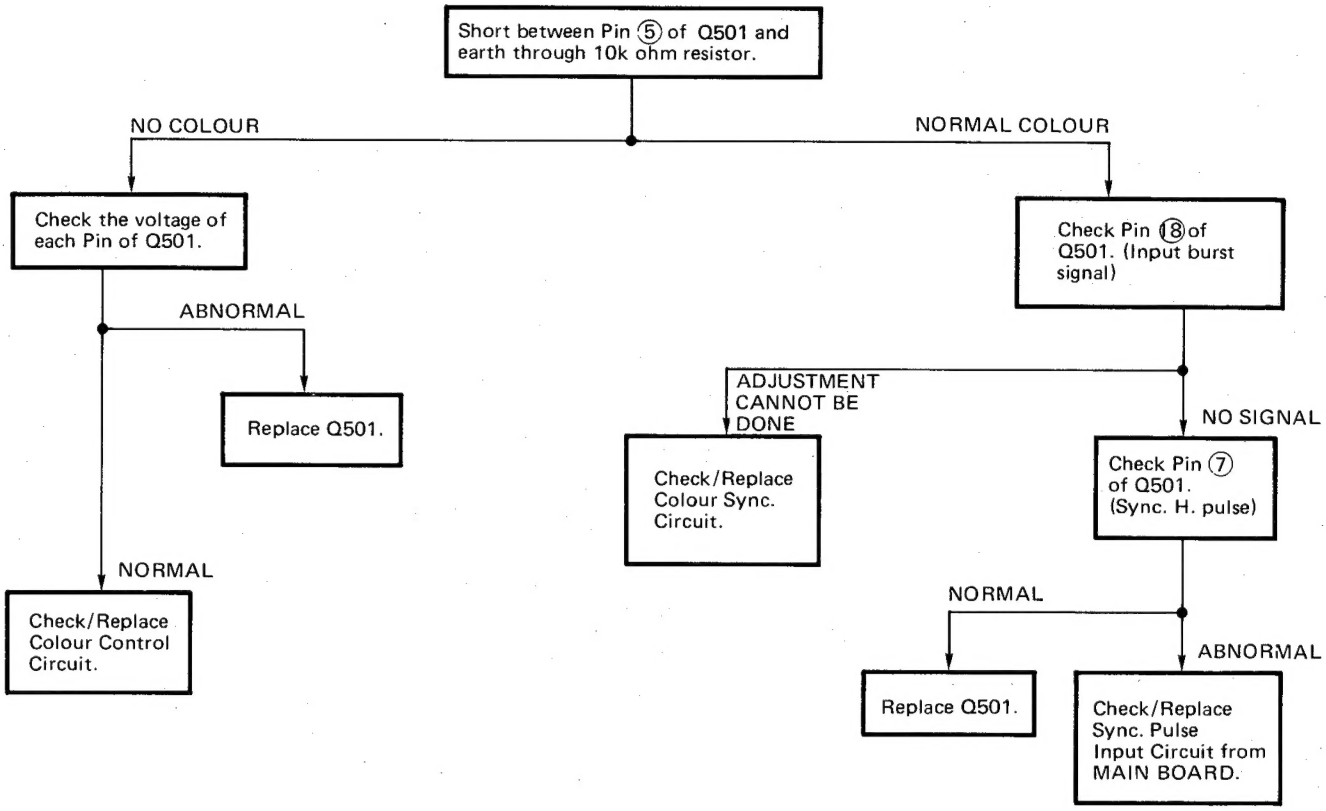
2. NO RASTER (SOUND NOISE OR WEAK)



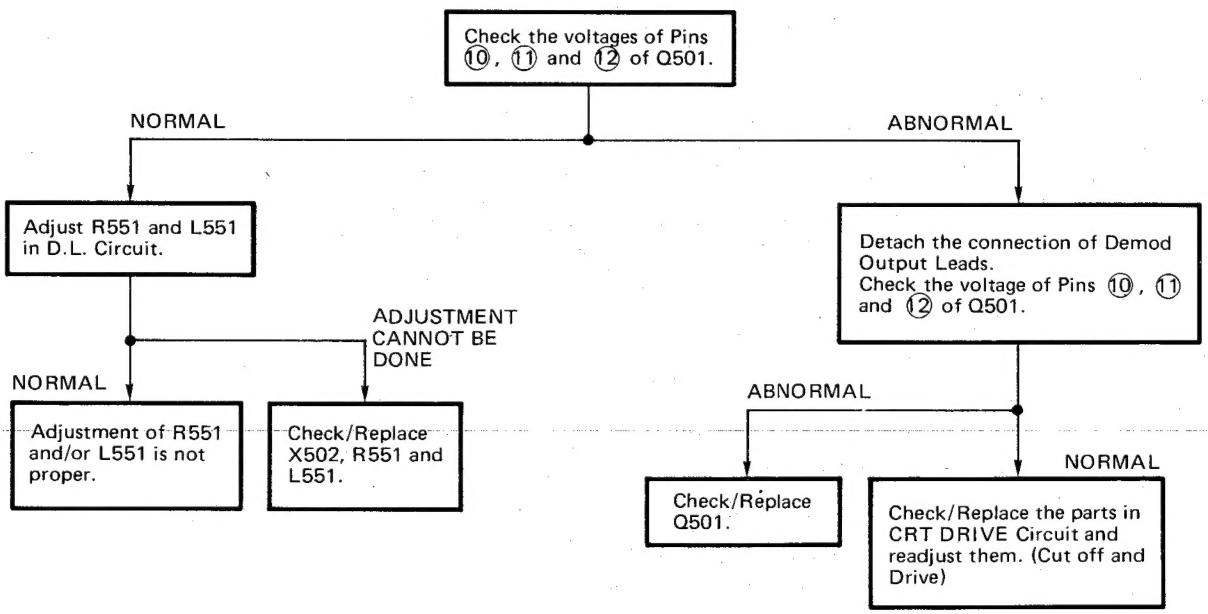
3. NO RASTER (SOUND OK)



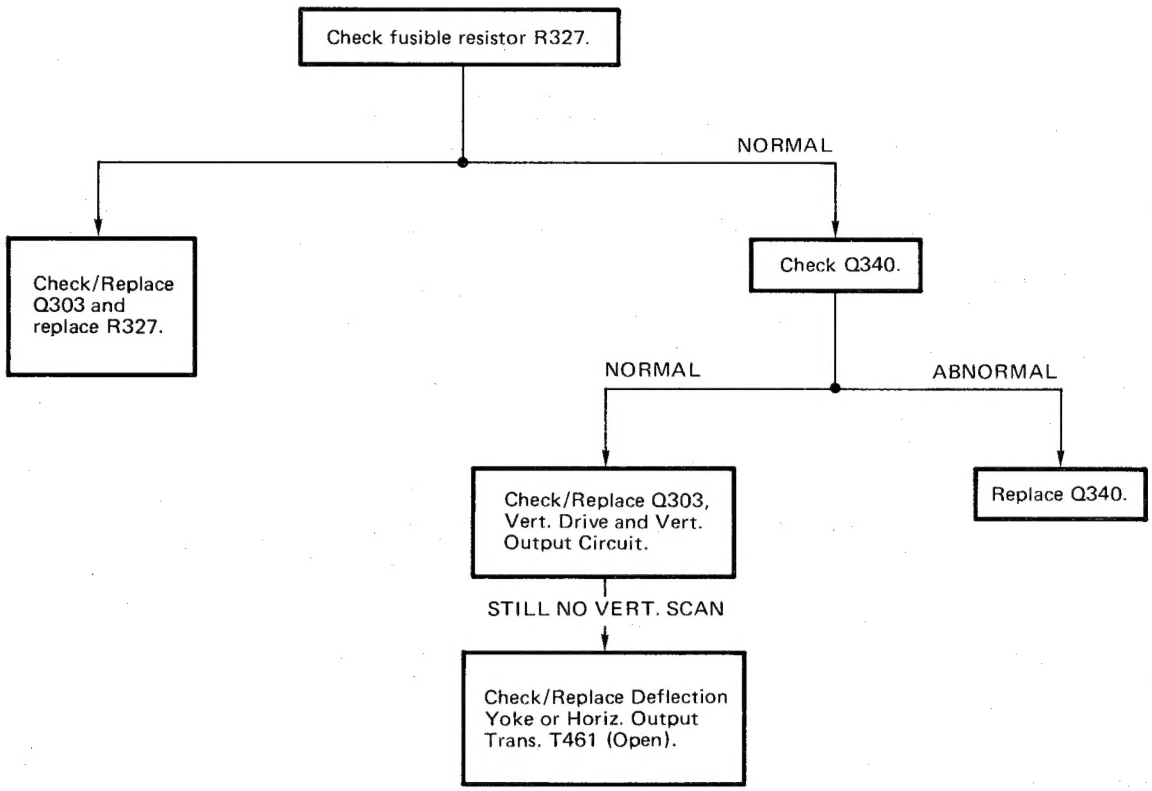
4. NO COLOUR



5. SPECIFIC TINTED COLOUR



6. NO VERT. SCAN (ONE HORIZ. LINE RASTER)



7. OUT OF VERT. SYNC. AND HORIZ. SYNC.

Check/Replace Sync. Circuit from pin ⑤ of Q340 to pin ⑥ of Q340.

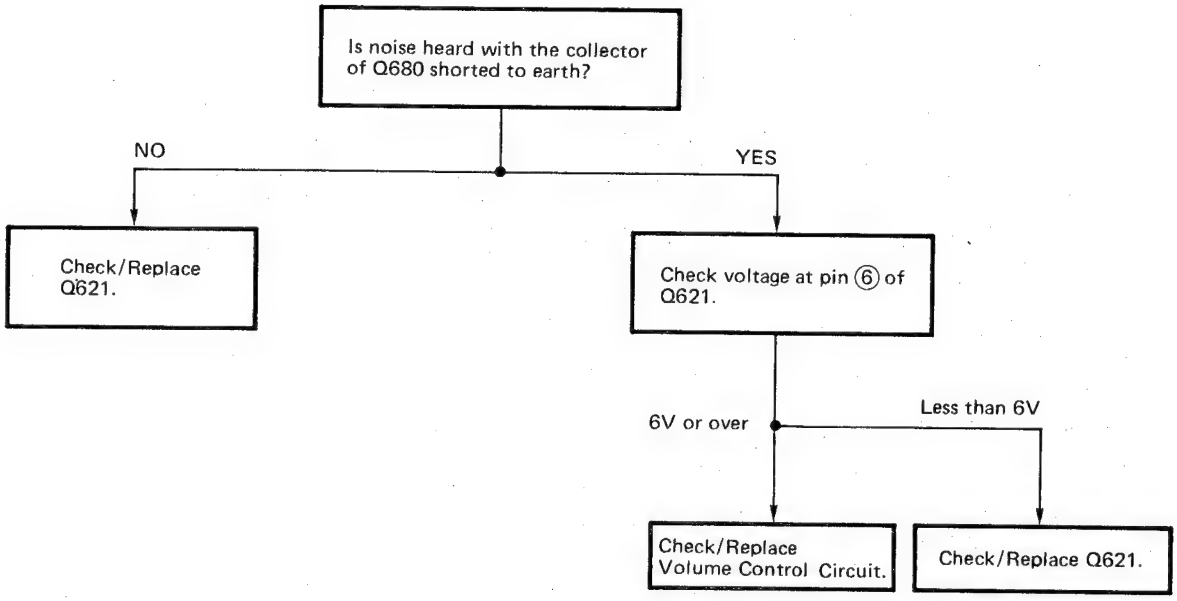
8. OUT OF VERT. SYNC.

Check/Replace Vert. OSC Circuit and Vert. Hold Circuit connected to Pins ①, ② and ⑩ of Q340. Check/Replace Q340.

9. OUT OF HORIZ. SYNC.

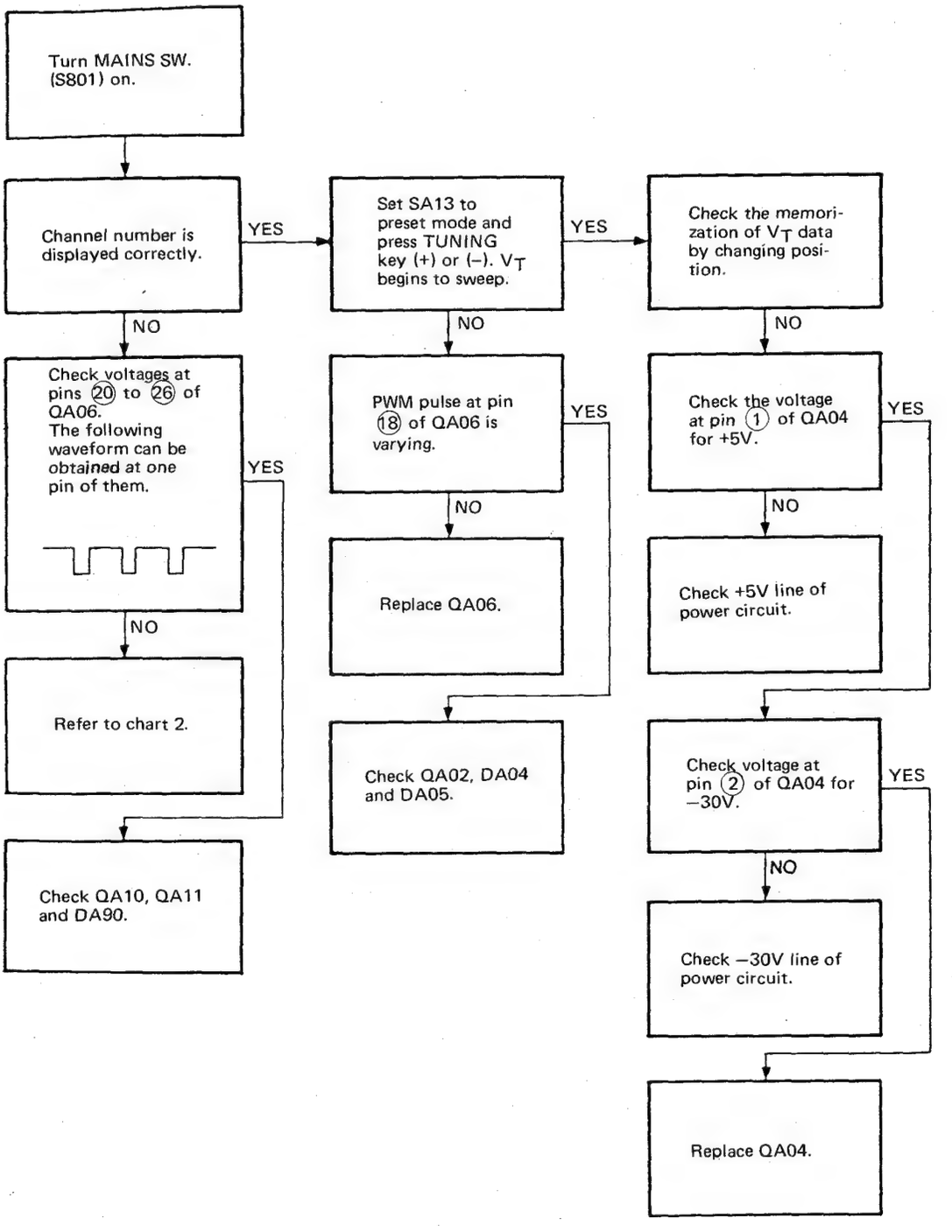
Check/Replace Horiz. OSC Circuit, Horiz. Hold and Horiz. AFC Circuit connected to Pins ⑩, ⑮ of Q340. Check/Replace Q340.

10. NO SOUND


Is noise heard with the collector of Q680 shorted to earth?
NO
YES
Check/Replace Q621.
Check voltage at pin ⑥ of Q621.
6V or over
Less than 6V
Check/Replace Volume Control Circuit.
Check/Replace Q621.

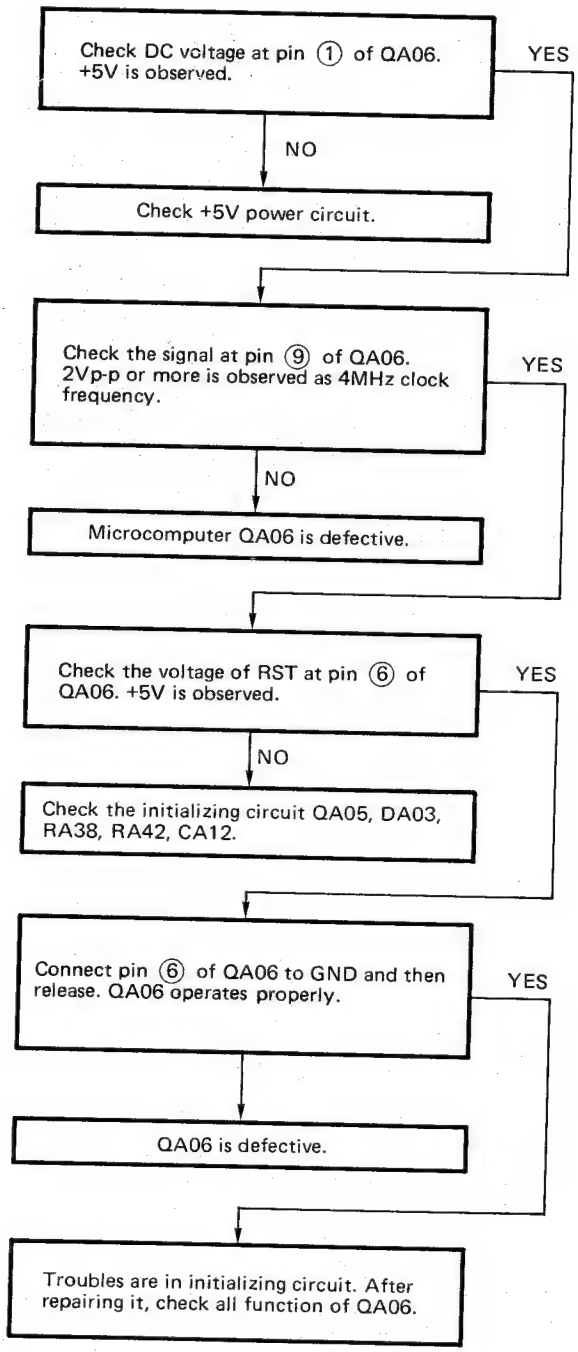
11. CHANNEL SELECTOR TROUBLE

[CHART 1]

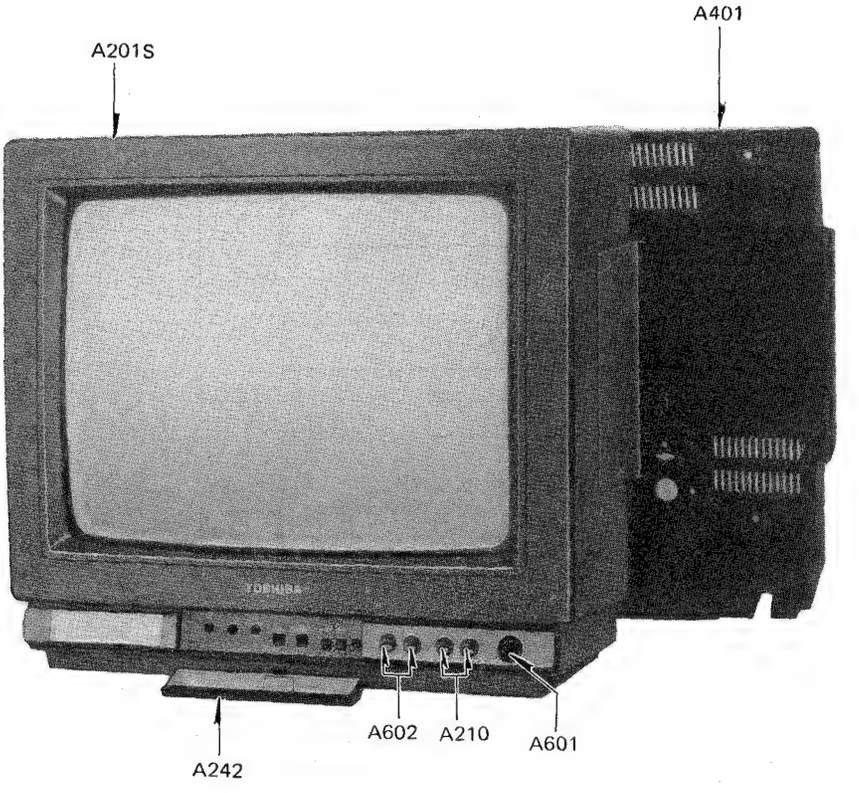


[CHART 2] Microcomputer QA06 Operation Check

Note: Before checking Microcomputer, check that control buttons and their connection work properly.



CABINET REPLACEMENT PARTS LIST



Location No.	Part No.	Description
A201S	23417660	Front Cover
A210	23874128	Button, Channel
A242	23999593	Door
A248	70393022	Nut
A401	23999607	Back Cover
A411	23995262	Label, Model Number
A601	23874124	Knob, POWER
A602	23874550	Knob, VOLUME
A701	23924192	Case
A702	23934671	Packing, Bottom
A703	23934670	Packing, Top
A710	23995263	Label, Model Number (Case)
B250	23848140	Holder, Power Cord
Y101	23994296	Owner's Manual
Y125	23124935	Aerial, VHF, Telescopic
Y145	23293977	Adapter, Aerial Matching, AD809E

CHASSIS REPLACEMENT PARTS LIST

WARNING: BEFORE SERVICING THIS CHASSIS, READ THE "X-RAY RADIATION PRECAUTION", "SAFETY PRECAUTION" AND "PRODUCT SAFETY NOTICE" ON PAGE 2 OF THIS MANUAL.

CAUTION: The international hazard symbols in the schematic diagram and the parts list designate components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list. The mounting position of replacements is to be identical with originals. Before replacing any of these components, read carefully the PRODUCT SAFETY NOTICE on page 2. Do not degrade the safety of the receiver through improper servicing.

NOTICE: The part number must be used when ordering parts, in order to assist in processing, be sure to include the Model number and Description.

Model 145E7DZ

ABBREVIATIONS:

Capacitors . . . . CD: Ceramic Disk, PF: Plastic Film, EL: Electrolytic
Resistors . . . . . CF: Carbon Film, CC: Carbon Composition, OMF: Oxide Metal Film, VR: Variable Resistor. MF: Metal Film, FR: Fusible Resistor.
(All CD and PF capacitors are ±5%, 50v and all resistors, ±5%, 1/6w unless otherwise noted.)

Location No.	Part No.	Description
CAPACITORS		
C171	24085031	EL, 1μF, ±20%, 25V, Non-Polar
C202	24550223	PF, 0.022μF, 63V
C206	24636479	EL, 4.7μF, 50V
C207	24636010	EL, 1μF, 50V
C231	24636100	EL, 10μF, 50V
C240	24636010	EL, 1μF, 50V
C301	24212121	CD, 120pF, ±10%
C303	24636010	EL, 1μF, 50V
C304	24797220	EL, 22μF, 50V
C305	24794470	EL, 47μF, 16V
C306	24550154	PF, 0.15μF, 63V
C310	24214331	CD, 330pF, 500V
C311	24797470	EL, 47μF, 50V
C313	24796101	EL, 100μF, 35V
C314	24436510	CD, 51pF
C316	24634222	EL, 2200μF, 25V
C317	24617998	EL, 1μF, ±10%, 50V
C318	24550333	PF, 0.033μF, 63V
C321	24550473	PF, 0.047μF, 63V
C401	24550104	PF, 0.1μF, 63V
C404	24550154	PF, 0.15μF, 63V
C405	24598272	PF, 2700pF
C406	24636100	EL, 10μF, 50V
C407	24636479	EL, 4.7μF, 50V
C408	24797220	EL, 22μF, 50V
C409	24550473	PF, 0.047μF, 63V
C410	24214271	CD, 270pF, 500V
C416	24214271	CD, 270pF, ±10%, 500V
C418	24212102	CD, 1000pF
⚠ C440	24095918	PF, 7500pF, 1600V
⚠ C442	24095946	PF, 0.43μF, 200V
C445	24833223	PF, 0.022μF, ±10%, 200V
C447	24643479	EL, 4.7μF, 200V
C449	24795331	EL, 330μF, 25V
C501	24436150	CD, 15pF
C502	24436270	CD, 27pF
C504	24550334	PF, 0.33μF, 63V
C505	24636479	EL, 4.7μF, 50V
C507	24232103	CD, 0.01μF, +80%, −20%

Location No.	Part No.	Description
C509	24212271	CD, 270pF, ±10%
C510	24212271	CD, 270pF, ±10%
C516	24353150	CD, 15pF
C518	24636010	EL, 1μF, 50V
C520	24550223	PF, 0.022μF, 63V
C525	24636010	EL, 1μF, 50V
C527	24794101	EL, 100μF, 16V
C528	24636010	EL, 1μF, 50V
C530	24436180	CD, 18pF
C534	24436301	CD, 300pF
C535	24436301	CD, 300pF
C536	24436301	CD, 300pF
C601	24436470	CD, 47pF
C602	24436470	CD, 47pF
C603	24550473	PF, 0.047μF, 63V
C604	24232103	CD, 0.01μF, +80%, −20%
C605	24436510	CD, 51pF
C607	24530473	PF, 0.047μF, ±10%, 63V
C608	24085031	EL, 1μF, ±20%, 25V, Non-Polar
C609	24232103	CD, 0.01μF, +80%, −20%
C610	24795101	EL, 100μF, 25V
C629	24550473	PF, 0.047μF, 63V
C630	24633100	EL, 10μF, 16V
C632	24636339	EL, 3.3μF, 50V
C636	24794471	EL, 470μF, 16V
C660	24232103	CD, 0.01μF, +80%, −20%
C681	24636010	EL, 1μF, 50V
C682	24636010	EL, 1μF, 50V
C683	24636010	EL, 1μF, 50V
C684	24636339	EL, 3.3μF, 50V
C801	24098999	PF, 0.1μF, ±20%, AC250V
C802	24098999	PF, 0.1μF, ±20%, AC250V
C803	24094906	CD, 4700pF, +80%, −20%, AC250V
C804	24094906	CD, 4700pF, +80%, −20%, AC250V
C805	24094906	CD, 4700pF, +80%, −20%, AC250V
C806	24094906	CD, 4700pF, +80%, −20%, AC250V

Location No.	Part No.	Description
C810	24086969	EL, 120μF, 400V
C811	24550334	PF, 0.33μF, 63V
C812	24636100	EL, 10μF, 50V
C813	24797470	EL, 47μF, 50V
C814	24215331	CD, 330pF, ±10%, 1kV
C815	24640972	EL, 33μF, 160V
C817	24214102	CD, 1000pF, ±10%, 500V
C820	24634222	EL, 2200μF, 25V
C821	24795101	EL, 100μF, 25V
C891	24215681	CD, 680pF, ±10%, 1kV
C902	24442391	CD, 390pF, ±10%, 2kV
CA01	24636010	EL, 1μF, 50V
CA02	24232103	CD, 0.01μF, +80%, −20%
CA03	24550104	PF, 0.1μF, 63V
CA04	24550104	PF, 0.1μF, 63V
CA05	24550104	PF, 0.1μF, 63V
CA06	24436221	CD, 220pF
CA07	24633100	EL, 10μF, 16V
CA10	24436300	CD, 30pF
CA11	24436300	CD, 30pF
CA12	24232103	CD, 0.01μF, +80%, −20%
CA13	24794470	EL, 47μF, 16V
CA14	24232103	CD, 0.01μF, +80%, −20%
CA15	24794470	EL, 47μF, 16V
CA16	24636100	EL, 10μF, 50V
CA17	24642339	EL, 3.3μF, 160V
CA18	24633220	EL, 22μF, 16V
CA19	24212102	CD, 1000pF, ±10%
CA20	24212391	CD, 390pF, ±10%
CA27	24633100	EL, 10μF, 16V
CB01	24232103	CD, 0.01μF, +80%, −20%
CB03	24232103	CD, 0.01μF, +80%, −20%
CB04	24530104	PF, 0.1μF, ±10%, 63V
CB11	24794101	EL, 100μF, 16V
CM01	24436220	CD, 22pF
CM02	24232103	CD, 0.01μF, +80%, −20%
CM03	24550104	PF, 0.1μF, 63V
CM04	24550104	PF, 0.1μF, 63V
CM05	24636010	EL, 1μF, 50V
CM06	24633100	EL, 10μF, 16V
CM07	24232103	CD, 0.01μF, +80%, −20%
CM08	24212102	CD, 1000pF, ±10%
CM09	24212102	CD, 1000pF, ±10%
CM10	24550104	PF, 0.1μF, 63V
CM11	24212102	CD, 1000pF, ±10%
CM12	24636010	EL, 1μF, 50V
CM13	24550223	PF, 0.022μF, 63V
CM14	24356270	CD, 27pF
CM15	24357820	CD, 82pF
CM16	24550104	PF, 0.1μF, 63V
CM17	24356390	CD, 39pF
CM50	24093990	Variable Capacitor, 5.5to30pF, 100V
CM64	24212102	CD, 1000pF, ±10%
CM80	24633100	EL, 10μF, 16V

RESISTORS

R201	24366331	CF, 330 ohm
R202	24366102	CF, 1k ohm
R203	24366221	CF, 220 ohm
R204	24366152	CF, 1500 ohm
R205	24366301	CF, 300 ohm
R209	24366122	CF, 1200 ohm
R211	24366100	CF, 10 ohm
R212	24366153	CF, 15k ohm
R213	24366473	CF, 47k ohm
R215	24366562	CF, 5600 ohm
R216	24366302	CF, 3k ohm
R218	24366152	CF, 1500 ohm
R219	24366272	CF, 2700 ohm
R220	24366822	CF, 8200 ohm
R221	24366222	CF, 2200 ohm
R222	24366333	CF, 33k ohm
R223	24366471	CF, 470 ohm
R231	24366102	CF, 1k ohm
R240	24366333	CF, 33k ohm
R241	24366103	CF, 10k ohm
R243	24366184	CF, 180k ohm
R256	24063816	VR, 10k ohm, 0.08W
R257	24063816	VR, 10k ohm, 0.08W
R301	24366102	CF, 1k ohm
R306	24366220	CF, 22 ohm
R308	24366562	CF, 5600 ohm
R311	24366224	CF, 220k ohm
R315	24366153	CF, 15k ohm
R316	24366134	CF, 130k ohm
⚠ R317	24383471	OMF, 470 ohm, 2W
R318	24945275	CC, 2.7M ohm, ±10%, 1/4W
⚠ R319	24381102	OMF, 1000 ohm, 1/2W
R320	24366102	CF, 1k ohm
⚠ R323	24321129	OMF, 1.2 ohm, 1/2W
⚠ R327	24321189	OMF, 1.8 ohm, 1/2W
R332	24366362	CF, 3600 ohm
R333	24366202	CF, 2k ohm
R352	24066935	VR, 200k ohm, 1/10W
R401	24366104	CF, 100k ohm
R402	24366223	CF, 22k ohm
R404	24366821	CF, 820 ohm
R406	24366303	CF, 30k ohm
R408	24366182	CF, 1800 ohm
R409	24366153	CF, 15k ohm
R411	24366330	CF, 33 ohm
⚠ R416	24384182	OMF, 1800 ohm, 3W
R418	24366820	CF, 82 ohm
⚠ R440	24552751	OMF, 750 ohm, 1/2W
⚠ R444	24321109	OMF, 1 ohm, 1/2W
⚠ R448	24322189	OMF, 1.8 ohm, 1W
R451	24066952	VR, 10k ohm, 1/10W
⚠ R482	24384752	OMF, 7500 ohm, 3W
R501	24366821	CF, 820 ohm
R506	24366102	CF, 1k ohm
R509	24366471	CF, 470 ohm
R510	24366182	CF, 1800 ohm
R516	24366123	CF, 12k ohm
R518	24366223	CF, 22k ohm
R519	24366105	CF, 1M ohm
R520	24366202	CF, 2k ohm
R523	24366331	CF, 330 ohm
R525	24366331	CF, 330 ohm
R527	24366331	CF, 330 ohm
R537	24366222	CF, 2200 ohm
R538	24366222	CF, 2200 ohm
R539	24366222	CF, 2200 ohm
R540	24366122	CF, 1200 ohm
R541	24366102	CF, 1k ohm
R542	24366102	CF, 1k ohm
R543	24366221	CF, 220 ohm
R544	24366221	CF, 220 ohm

Location No.	Part No.	Description
R545	24366221	CF, 220 ohm
R546	24366151	CF, 150 ohm
R547	24366151	CF, 150 ohm
R551	24066955	VR, 1k ohm, 1/10W
R552	24066952	VR, 10k ohm, 1/10W
R555	24063816	VR, 10k ohm, 0.08W
R557	24066913	VR, 10k ohm, 1/10W
R558	24066913	VR, 10k ohm, 1/10W
R559	24066913	VR, 10k ohm, 1/10W
⚠ R591	24553153	OMF, 15k ohm, 1W
⚠ R592	24553153	OMF, 15k ohm, 1W
⚠ R593	24553153	OMF, 15k ohm, 1W
R601	24366561	CF, 560 ohm
R602	24366102	CF, 1k ohm
R603	24366222	CF, 2200 ohm
R604	24366102	CF, 1k ohm
R622	24366151	CF, 150 ohm
⚠ R623	24321479	OMF, 4.7 ohm, 1/2W
R624	24366103	CF, 10k ohm
⚠ R625	24322569	OMF, 5.6 ohm, 1W
R681	24366103	CF, 10k ohm
R682	24366103	CF, 10k ohm
R683	24366222	CF, 2200 ohm
R684	24366242	CF, 2400 ohm
R691	24366103	CF, 10k ohm
R692	24366103	CF, 10k ohm
R693	24366103	CF, 10k ohm
⚠ R801	24007681	Cement, 6.2 ohm, 5W
R811	24942104	CC, 100k ohm, 1/2W
R812	24942124	CC, 120k ohm, 1/2W
⚠ R813	24381100	OMF, 10 ohm, 1/2W
⚠ R814	24552361	OMF, 360 ohm, 1/2W
⚠ R815	24552131	OMF, 130 ohm, 1/2W
⚠ R816	24982688	MF, 0.68 ohm, 1/2W
R837	24942223	CC, 22k ohm, 1/2W
⚠ R840	24321229	OMF, 2.2 ohm, 1/2W
⚠ R841	24982109	MF, 1 ohm, 1/2W
⚠ R890	24000918	PTC Thermistor, 18 ohm, ±20%, 290V
R901	24946472	CC, 4700 ohm, ±10%, 1/2W
R902	24946472	CC, 4700 ohm, ±10%, 1/2W
R903	24946472	CC, 4700 ohm, ±10%, 1/2W
⚠ RA01	24009973	OMF, 12k ohm, 2W
RA02	24366153	CF, 15k ohm
RA03	24366333	CF, 33k ohm
RA04	24366333	CF, 33k ohm
RA05	24366333	CF, 33k ohm
RA06	24366303	CF, 30k ohm
RA07	24890225	CF, 2.2M ohm, 1/4W
RA08	24366751	CF, 750 ohm
RA09	24366102	CF, 1k ohm
RA10	24366103	CF, 10k ohm
RA12	24366104	CF, 100k ohm
RA14	24366103	CF, 10k ohm
RA15	24366103	CF, 10k ohm
RA16	24366242	CF, 2400 ohm
RA17	24366242	CF, 2400 ohm
RA18	24366105	CF, 1M ohm
RA19	24366334	CF, 330k ohm
RA20	24366102	CF, 1k ohm
RA21	24366223	CF, 22k ohm
RA22	24366472	CF, 4700 ohm
RA23	24366133	CF, 13k ohm
RA24	24366512	CF, 5100 ohm

Location No.	Part No.	Description
⚠ RA25	24381160	OMF, 16 ohm, 1/2W
⚠ RA26	24554111	OMF, 110 ohm, 2W
RA27	24366103	CF, 10k ohm
RA29	24366331	CF, 330 ohm
RA30	24366331	CF, 330 ohm
RA31	24366331	CF, 330 ohm
RA32	24366331	CF, 330 ohm
RA33	24366331	CF, 330 ohm
RA34	24366331	CF, 330 ohm
RA35	24366331	CF, 330 ohm
RA38	24366101	CF, 100 ohm
RA41	24366121	CF, 120 ohm
RA42	24366562	CF, 5600 ohm
⚠ RA45	24382822	OMF, 8200 ohm, 1W
RA85	24366302	CF, 3k ohm
RA86	24366302	CF, 3k ohm
RA96	24366101	CF, 100 ohm
RA97	24366472	CF, 4700 ohm
RA98	24366122	CF, 1200 ohm
⚠ RB03	24553153	OMF, 15k ohm, 1W
RB11	24366103	CF, 10k ohm
RM02	24366221	CF, 220 ohm
RM03	24366152	CF, 1500 ohm
RM04	24366152	CF, 1500 ohm
RM05	24366222	CF, 2200 ohm
RM10	24366561	CF, 560 ohm
RM11	24366222	CF, 2200 ohm
RM18	24366102	CF, 1k ohm
RM20	24366563	CF, 56k ohm
RM51	24066955	VR, 1k ohm, 1/10W
RM52	24066955	VR, 1k ohm, 1/10W
RM71	24366391	CF, 390 ohm
RM72	24366681	CF, 680 ohm

COILS & TRANSFORMERS

L201	23237987	Coil, Peaking, TRF4100AC
L311	23103940	Coil (Ferrite Bead), TEM2001
L501	23237982	Coil, Peaking, TRF4270AC
L502	23237985	Coil, Peaking, TRF4150AC
L503	23239835	Coil, Peaking, TRF4109AJ
L551	23270999	Coil, Delay, TRF5402
L601	23237985	Coil, Peaking, TRF4150AC
L602	23237981	Coil, Peaking, TRF4330AC
L603	23237991	Coil, Peaking, TRF4479AC
L604	23237986	Coil, Peaking, TRF4120AC
L811	23237995	Coil, Peaking, TRF4229AC
⚠ L901	23200781	Coil, Degaussing, TSB2229
LA01	23237999	Coil, Peaking, TRF4109AC
LM01	23250907	Coil, Delay Line, TRF2075
LM02	23237987	Coil, Peaking, TRF4100AC
LM03	23237988	Coil, Peaking, TRF4829AC
LM51	23262797	Coil, IF Coil, TRF1093
LM52	23262798	Coil, IF Coil, TRF1092
LM57	23237987	Coil, Peaking, TRF4100AC
LM58	23237987	Coil, Peaking, TRF4100AC
⚠ T401	23224983	Transformer, Horiz. Drive, TLN1039
⚠ T461	23226401	Transformer, Flyback, TFB4036AD
T801	23211929	Line Filter, TRF3130
⚠ T802	23213626	Transformer, Converter, TPW3054A

Location No.	Part No.	Description
SEMICONDUCTORS		
IC303	23119548	IC, AN5515
IC340	23318081	IC, TDA2579
IC405	B0373230	IC, TA78012AP
IC501	23318098	IC, TDA3565
IC621	23318096	IC, AN5256
ICA04	23119456	IC, M58658P
ICA06	23318079	IC, M50430-584SP
ICB01	23119441	IC, LA7910
ICM01	23318133	IC, TDA3592A
Q171	A6048350	Transistor, 2SK30ATM-Y
Q201	23114691	Transistor, BC557A
Q303B	23035308	Screw, BTB3X8SZN
Q402	A6330004	Transistor, 2SC2482 FA-1
⚠ Q404	A6364301	Transistor, 2SC3715
Q505	A6330000	Transistor, 2SC2482
Q507	A6330000	Transistor, 2SC2482
Q509	A6330000	Transistor, 2SC2482
Q680	23114632	Transistor, BC547B
Q691	23114689	Transistor, BC547A
Q801	23114521	Transistor (STR), STR50020
Q801B	23779002	Screw, PPW3X05X12SB
QA02	23114689	Transistor, BC547A
QA03	23114689	Transistor, BC547A
QA05	23114691	Transistor, BC557A
QA07	23114688	Transistor, BC327
QA10	23114546	Transistor, BC557B
QA11	23114546	Transistor, BC557B
QA12	23114689	Transistor, BC547A
QA13	23114689	Transistor, BC547A
QB02	23114691	Transistor, BC557A
D201	23115599	Diode, 1N4148
D202	23115599	Diode, 1N4148
D203	23115599	Diode, 1N4148
D204	23115599	Diode, 1N4148
D205	23115599	Diode, 1N4148
D231	23115526	Diode, Zener, BZX79B5V1
D242	23115599	Diode, 1N4148
D244	A7150041	Diode, 1SS104
D302	23118479	Diode, BYD33J
D305	23118479	Diode, BYD33J
D321	23115599	Diode, 1N4148
D322	23118982	Diode, Zener, ZPD24
D403	23115604	Diode, Zener, ZPD6.2
D406	23118479	Diode, BYD33J
D408	23118479	Diode, BYD33J
D805	23118479	Diode, BYD33J
D806	23115530	Diode, RG2
D807	23118479	Diode, BYD33J
D808	23115523	Diode, Zener, SR2M
D810	23118124	Diode, LB-156 (LF-B)
D840	23118479	Diode, BYD33J
DA03	23118741	Diode, Zener, BZX79B4V3
DA04	23115599	Diode, 1N4148
DA05	23115878	Diode, Zener, μPC574JC
DA06	A7288601	Diode, 1S2186 FA-1
DA07	A7288601	Diode, 1S2186 FA-1
DA08	23115599	Diode, 1N4148
DA09	23115599	Diode, 1N4148
DA10	23115599	Diode, 1N4148
DA11	23118740	Diode, Zener, BZX79B15
DA12	23118479	Diode, BYD33J
DA13	23118740	Diode, Zener, BZX79B15
DA14	23115599	Diode, 1N4148

Location No.	Part No.	Description
DA15	23115599	Diode, 1N4148
DA24	23115599	Diode, 1N4148
DA25	23115599	Diode, 1N4148
DA26	23115599	Diode, 1N4148
DA28	23115599	Diode, 1N4148
DA90	23118714	Diode (LED), SEL550ST, Red
DB01	23115599	Diode, 1N4148
DB02	23115599	Diode, 1N4148
DB03	23115599	Diode, 1N4148
DM01	23115599	Diode, 1N4148
MISCELLANEOUS		
⚠ F801	23144896	Fuse, T2.0A
F801A	23845691	Fuse Clip
⚠ P001	23142508	Aerial Terminal, AT941S
⚠ P801	23176705	Power Cord
S201	23145682	Switch, Lever, 1C3P
⚠ S801	23145524	Switch, PBMS-3025
S801B	23035308	Screw, BTB3X8SZN
SA01	23145430	Switch, Push, 1C1P
SA02	23145430	Switch, Push, 1C1P
SA03	23145430	Switch, Push, 1C1P
SA04	23145430	Switch, Push, 1C1P
SA05	23145430	Switch, Push, 1C1P
SA06	23145430	Switch, Push, 1C1P
SA07	23145430	Switch, Push, 1C1P
SA08	23145579	Switch, Push, 2C2P
⚠ V901A	23901874	Socket, CRT, 8P
W201	23250951	Coil, Delay Line, TRF2048
W661	23151295	Speaker, SPK1188, 77x77mm, 16 ohm
X501	23153774	Crystal, 8.8MHz
X502	23250949	Delay Line, PAL Chroma, DL701
XM01	23250950	1H-Delay Line, Secam, DL711
XM02	23153826	Crystal, 4433.619kHz
Z201	23107915	Ceramic Video Trap, 5.5to5.7MHz, TCF1017
Z203	23107913	Ceramic Video Trap, 6.5MHz, TCF1018
Z601	23107931	Ceramic Filter, 5.5MHz, TCF1007
Z602	23107660	Ceramic Discri, 5.5MHz, TCF1054
Z661	23107742	Ceramic Filter, 3MHz, TEM1014
Z662	23107742	Ceramic Filter, 3MHz, TEM1014
ZA01	23153847	Ceramic Resonator, 4MHz, TCR1014
PC BOARD ASSEMBLIES		
U902A	23332724	Main Board, PW5981-1
U902B	23332725	CRT Drive Board, PW5981-2
PICTURE TUBE		
⚠ V901	23112413	Picture Tube, A34EAC00X10
TUNER		
H001	23121679	Tuner, VHF/UHF, EG431AV

145E7DZ

SCHEMATIC DIAGRAM

IMPORTANT SAFETY NOTICE

Component marked with the International Hazard Symbol must, if changed, be replaced by an approved type and must be mounted as the original. This will ensure that the safety standards adhered to during manufacture will be maintained following any servicing procedure.

OBSERVATION OF VOLTAGES AND WAVEFORMS

1. Voltage readings were obtained using a high impedance digital voltmeter.
2. (—) or ground lead of instruments should be connected to the ground marked (⊥) in the shematic on checking Non-isolated circuit surrounded by mark but should be connected to the points marked (⏚) on checking isolated circuit.
3. The voltage readings may vary as much as ±20%.
4. Check that the Tuning, A.F.C., Brightness, Contrast and Colour controls are adjusted for the best picture, making sure that the Contrast, Brightness and Colour controls are set near to their mid-positions.
5. The waveforms were taken using a standard colour bar signal and were observed using a wide band oscilloscope via a low capacity probe.

NOTES:

1. This circuit diagram is subject to change without notice.

EXPRESSION

VALUE OF RESISTOR, CAPACITOR and INDUCTOR

1. Resistance is shown in ohm, k=1,000, M=1,000,000.
2. Unless otherwise noted in schematic, all capacitor values less than 1 are expressed in μF and the values more than 1 in pF.
3. Unless otherwise noted in schematic, all inductor values more than 1 are expressed in μH, and the values less than 1 in H.

GROUNDING SYMBOL

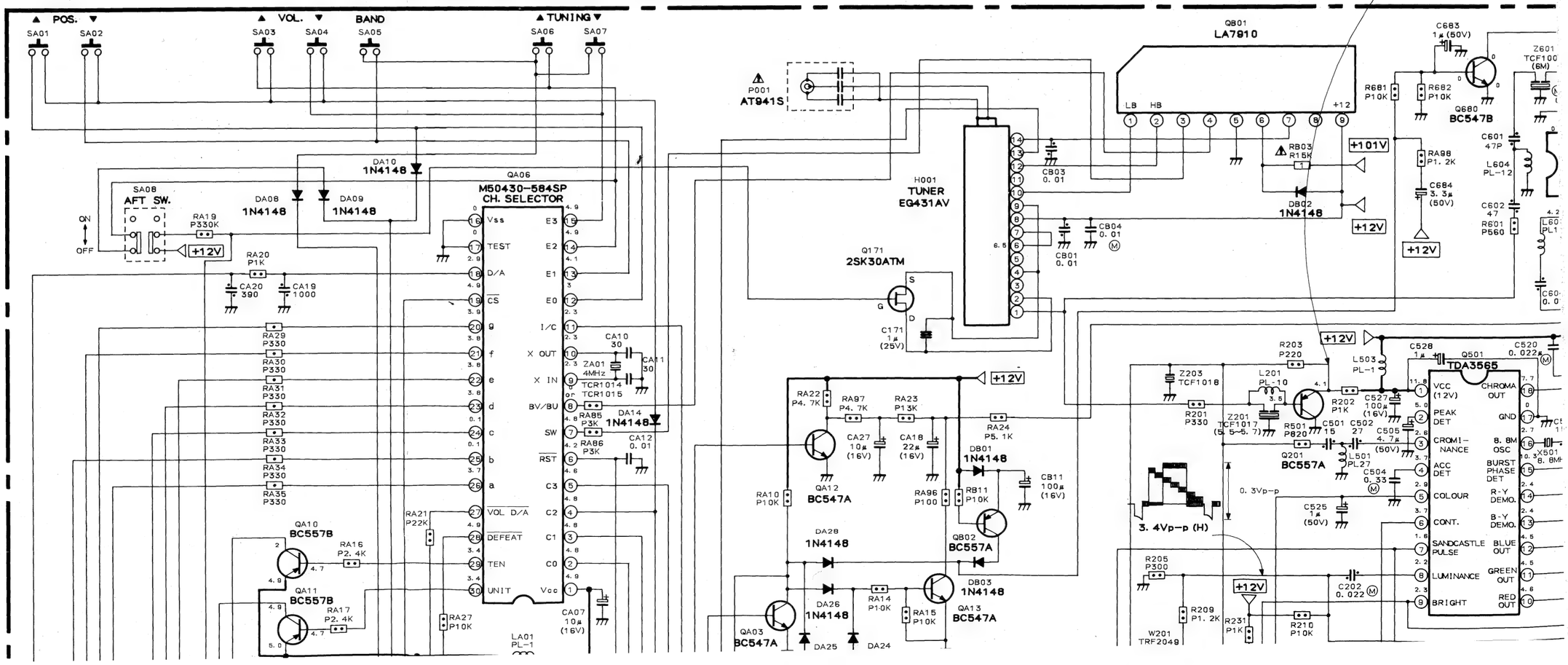
1. ⊥: Non isolated ground, ⏚ : Isolated ground.

RESIS

Prefixe

C
Ox
In
Ceme

U902A MAIN BOARD PW5981-1



m is subject to change without notice.

CAPACITOR and INDUCTOR

ohm, k=1,000, M=1,000,000.
ed in schematic, all capacitor values less than 1 are expressed in
re than 1 in pF.
ed in schematic, all inductor values more than 1 are expressed in
s than 1 in H.

d, ⏚ : Isolated ground.

RESISTORS

Prefixed to values:

TYPE	MARK
Carbon Comp.	S
Oxide Metal Film	R
Ins. Carbon Film	P
Wire Wound	W
Cement covered W.W.	NO MARK
Fusible Res.	FR

Suffixes to values:

TOLERANCE	MARK
±1%	(F)
±2%	(G)

Suffixes to VR values:

LAW	MARK
Linear	(B)
'C' Curve Characteristic	(C)

Rating Markings:

WATTAGE	MARK
1/6W	
1/4W	
1/2W	
1W	1
2W	2

WATTAGE	MARK
3W	3
5W	5
10W	10
15W	15
20W	20
25W	25

CAPACITORS

Rating Markings:

Type	Mark
Ceramic Disc 50V Only	
Electrolytic	
Electrolytic Non-Polar	
Variable Capacitor	
Other	

U902B CRT DRIVE BOARD PW5981-2

3. 1Vp-p (H)
2. 3Vp-p
5Vp-p
6. 8Vp-p
3. 4Vp-p (H)
0. 3Vp-p
6Vp-p
80Vp-p
75Vp-p
90Vp-p
3. 6Vp-p (V)

DA90 SEL 550ST POSITION IND.

QA04 M58658P

QA10 BC557B

QA11 BC557B

QA03 BC547A

QA12 BC547A

QA13 BC547A

QA02 BC547A

QA05 BC557A

QA07 BC327

QB02 BC557A

QM01 TDA3592A

LM01 TRF2075

LM51 TRF1093

LM52 TRF1092

LA01 PL-1

Z201 TCF1017 (5.5~5.7)

Q201 BC557A

Q691 BC547A

Q801 STR-50020 (2 QR) REGULATOR

Q303

T801 LINE FILTER TRF3130

T802 TPW3054 CONVERTER TRANS.

DA05 μPC574JC

DA01 1N4148

DA02 1N4148

DA03 BZX79B4V3

DA04 1N4148

DA05 μPC574JC

DA06 1S2186

DA07 1S2186

DA08 TCR1015

DA11 BZX79B15

DA12 BYD33J

DA13 BZX79B15

DA14 1N4148

DA15 1N4148

DA24 1N4148

DA25 1N4148

DA26 1N4148

DA28 1N4148

DB01 1N4148

DB03 1N4148

DM01 1N4148

D231 BZX79B 5V1

D805 BYD33J

D806 RG-2

D807 BYD33J

D810 LB-156

+12V

+101V

3.4Vp-p (H)

0.3Vp-p

22Vp-p (V)

1.4Vp-p (V)

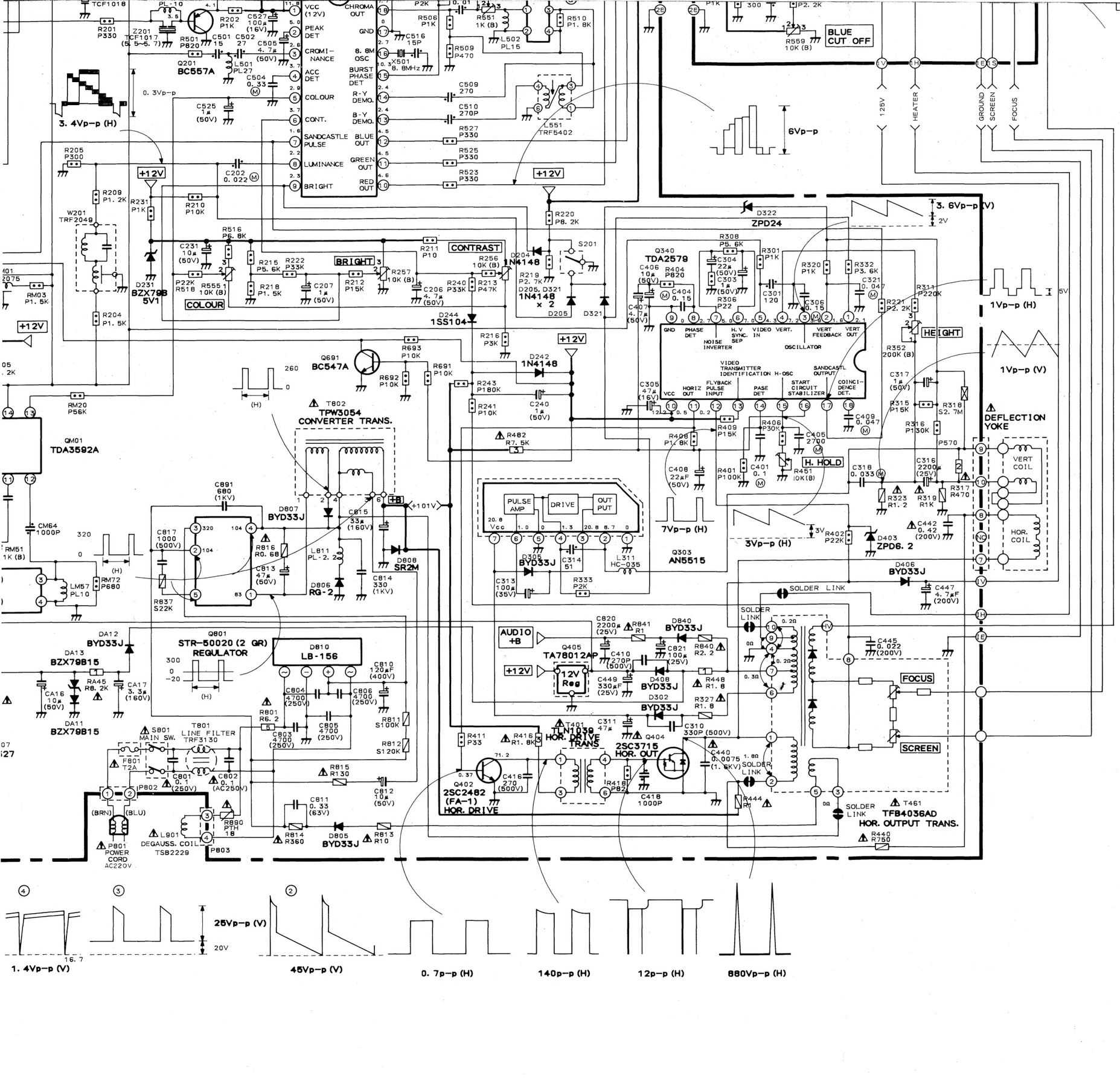
25Vp-p (V)

20V

45Vp-p (V)

BRIGHT

COLOUR


CHROMA OUT
VCC (12V)
PEAK DET
CROMI-NANCE
8.8M OSC
ACC DET
BURST PHASE DET
COLOUR
R-Y DEMO.
CONT.
B-Y DEMO.
SANDCASTLE PULSE
BLUE OUT
LUMINANCE
GREEN OUT
BRIGHT
RED OUT
TCF1018
TCF1017
Z201
Q201 BC557A
L501 PL27
L502 PL15
X501 8.8MHz
L551 TRF5402
3.4Vp-p (H)
0.3Vp-p
6Vp-p
+12V
W201 TRF2049
D231 BZX79B 5V1
BRIGHT
CONTRAST
COLOUR
D204 1N4148
D205, D321 1N4148 x 2
S201
D244 1SS104
Q691 BC547A
D242 1N4148
T802 TPW3054 CONVERTER TRANS.
QM01 TDA3592A
R482 R7.5K
D322 ZPD24
3.6Vp-p (V)
Q340 TDA2579
VIDEO TRANSMITTER IDENTIFICATION
H-OSC
SANDCASTL OUTPUT
FLYBACK PULSE INPUT
PASE DET
START CIRCUIT STABILIZER
COINCI-DENCE DET.
OSCILLATOR
NOISE INVERTER
H.V. SYNC. SEP
VIDEO IN
VERT. FEEDBACK
VERT OUT
1Vp-p (H)
1Vp-p (V)
HEIGHT
DEFLECTION YOKE
VERT COIL
HOR. COIL
H. HOLD
BLUE CUT OFF
90Vp-p
125V
HEATER
GROUND
SCREEN
FOCUS
PULSE AMP
DRIVE
OUT PUT
7Vp-p (H)
Q303 AN5515
3Vp-p (H)
D403 ZPD6.2
D406 BYD33J
SOLDER LINK
D305 BYD33J
D302 BYD33J
D808 SR2M
D807 BYD33J
D806 RG-2
D805 BYD33J
+B
+101V
AUDIO +B
Q405 TA78012AP
12V Reg
Q801 STR-50020 (2 QR) REGULATOR
D810 LB-156
DA12 BYD33J
DA13 BZX79B15
DA11 BZX79B15
S801 MAIN SW.
T801 LINE FILTER TRF3130
F801 T2A
P801 POWER CORD AC220V
P802
P803
(BRN)
(BLU)
L901 DEGAUSS. COIL TSB2229
T401 TLN1039 HOR. DRIVE TRANS
Q404 2SC3715 HOR. OUT
Q402 2SC2482 (FA-1) HOR. DRIVE
T461 TFB4036AD HOR. OUTPUT TRANS.
1.4Vp-p (V)
25Vp-p (V)
45Vp-p (V)
0.7p-p (H)
140p-p (H)
12p-p (H)
880Vp-p (H)

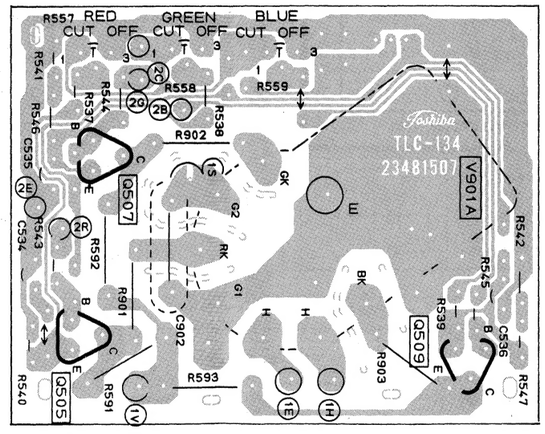
75Vp-p

90Vp-p

5V

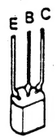
CRT DRIVE BOARD PW5981-2

BOTTOM (Foil) SIDE



TERMINAL VIEW OF TRANSISTOR

① BC327
BC337
BC547A
BC547B
BC547C
BC557A
BF324



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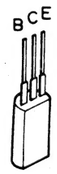
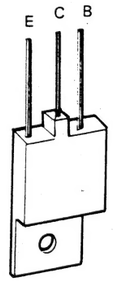
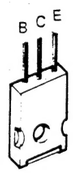
2SA1020



③ 2SC3715



④ 2SC3425



⑤ 2SK30ATM

MAIN BOARD PW5981-1

BOTTOM (Foil) SIDE

BOTTOM (Foil) SIDE